



# **Management of Accidentally Injected Ivermectin Overdose Inflicted Toxicity in German Shepherd Dog**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. Author RS wrote the manuscript. Authors JD and JKC handle and treated the patient. Author SKK managed the literature searches and technical writer. All authors read and approved the final manuscript.*

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**Case Report**

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## **ABSTRACT**

An owner complaint about adverse reaction half an hour after accidental injection of ivermectin to a dog. The dog showed hyperthermia, bradycardia, dyspnoea, hypersalivation and frothy discharge, dilated pupil and ataxia. The dog was symptomatically treated with normal saline, dexamethasone, tribivet-M and atropine sulphate. Adverse symptoms were abolished after two hours. Instant reporting by the owner and prompt treatment in the present study helps to avoid further deterioration in the dog's condition and made possible fast recovery.

**Keywords:** Dog; macrocyclic lactone; endectocide; ataxia.

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## 1. INTRODUCTION

Ivermectin is commonly used antiparasitic (Endectocide) drug both in human and animals. It is a macrocyclic lactone (ML), isolated from *Streptomyces avermitilis* as avermectins [1]. The avermectin has 4 components (A<sub>1</sub>, A<sub>2</sub>, B<sub>1</sub> and B<sub>2</sub>), B<sub>1</sub> displayed good characteristics of efficacy and safety. Ivermectin acts as a GABA agonist and results in the neuromuscular blockade, paralysis, and death [2]. In veterinary practice, it is used in both small and large animals. In dogs, it is used against *Ancylostoma caninum*, *Uncinaria stenocephala*, *Toxocara canis*, microfilariae of *Dirofilaria immitis*, adult Ascaris, Strongyloides, Trichuris species and ectoparasites [3-5]. It is available as topical (Paste and pour-on), oral (Liquid and bolus) injectable and feed pre-mix. Its dose rate varying from 6-600 µgm/kg according to the involved organism. In general, signs of acute toxicity are rarely occurred at single dosages of 1 mg/kg or less. At 2.5 mg/kg and 5 mg/kg, mydriasis and tremors occur, respectively. severe tremors and ataxia are seen at doses of 10 mg/kg. Its LD<sub>50</sub> is 80 mg/kg but deaths may occur when dosages exceeded 40 mg/kg [6]. Its toxicity was primarily seen in collies, Shetland sheepdogs, and Australian shepherds. It has been also seen in longhaired whippets, old English sheepdogs, Silken Windhounds, white Swiss shepherds, German shepherds, and some mixes of these breeds have a defect in the ABCB1 gene [7,8]. Its toxicity results in neurologic depression, ataxia, mydriasis, blindness, tremors, hypersalivation, seizures, retinal oedema, respiratory depression, hyperthermia, and coma and death in severe cases [9-11]. After going through available literature, there is a lack of data regarding the sudden onset of ivermectin overdose related toxicity and dissolution of adverse symptoms on the same day. So, this is the first documented report of ivermectin overdose inflicted toxicity showing sudden onset and early disappearance of adverse symptoms following quick management of toxicity.

### 1.1 History and Case Presentation

An eight months old German shepherd dog (20 kg) presented to Veterinary clinical complex of College of Veterinary and Animal Science, Navania, Udaipur (Rajasthan) for treatment of maggot wound located at ventral to the neck, near rami of the mandible. The dog also had a rough coat and ectoparasites infestation, so after dressing injected ivermectin (Hitek 100 ml, 10

mg/ml, Virbac India) by a para-vet. He was using a 10 ml syringe and inadvertently injected 2 ml ivermectin. About half an hour, owner complaint that dog showing excessive salivation, frothy discharge from the mouth, dilated pupil and ataxia. On clinical examination, there was 42.2°C temperature, bradycardia and dyspnoea.

### 1.2 Treatment

There is no specific antidote for ivermectin so symptomatic treatment was done. Normal saline was given 90 ml/kg/hour I/V, 2 ml Dexamethasone (Dexona 2 ml, 4 mg/2ml, Zydus healthcare Ltd.) I/V, atropine sulphate (Atropine sulphate injection 10 ml, Morvel Laboratories Ltd., Gujrat) 0.02 mg/kg I/V, 2 ml Tribivet-M I/V and ice pack were employed. Within two hours temperature return to normal, salivation was stopped and the dog walked with a normal gait. Follow up done for the next 2 days, no abnormal behaviour was noticed.

## 2. DISCUSSION

The Ivermectin's LD<sub>50</sub> is 80 mg/kg for dogs [6] but German shepherd show ivermectin toxicity signs at relatively low ivermectin dosages because a small percentage of this breed does carry the ABCB1 gene defect [12,13]. In the present case toxicity developed within 30 minutes of subcutaneous injection while Hopper et al [14] observed 3 hours after peroral intake. There are no specific antidotes for ML toxicosis, with good supportive care severely affected animal can make a complete recovery in several days [15], but in present case symptoms of toxicity abolished in a day. Instant reporting by the owner and prompt treatment in the present study helps to avoid further deterioration in the dog's condition and made possible fast recovery. The present type of accidental toxicities can be noticed in hospitals where both large and small animal treatment carried out and large volume syringes are used for small animal medication.

## 3. CONCLUSION

Ivermectin may prove dangerous in certain breed of dogs and even may cause death. Therefore, we must have thorough knowledge of dosages, route of administration, contradiction (Age, breed, disease), compatibility, adverse reaction and antidote of the drugs which are going to be administer in an animal.

## ETHICAL APPROVAL

Animal Ethic committee approval has been taken to carry out this study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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